



U.S. ARMY CHEMICAL MATERIALS AGENCY

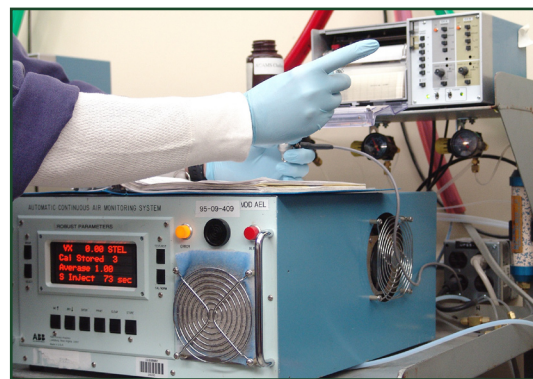
Vapor Screening Level (VSL)

The U.S. Centers for Disease Control and Prevention (CDC), the U.S. Environmental Protection Agency and the National Research Council give health protection guidance to the U.S. Army Chemical Materials Agency (CMA) as it executes its mission of safely storing and destroying the nation's aging chemical weapons. CMA continuously researches, develops and implements ways to provide maximum protection to workers, the public and the environment.

By using advanced monitoring systems placed in and around storage and disposal areas, CMA ensures the air is safe for workers and the public. The airborne exposure limit (AEL) is a guideline developed by the CDC to determine how long people can be exposed to potential pollutants in the air without resulting effects to their health. AELs are based on a short-term exposure limit (STEL) for acute worker exposure, a worker population limit (WPL) for long-term worker exposure and the general population limit (GPL) for the public. The GPL is the concentration that the unprotected general population can be exposed to 24 hours a day, seven days a week, for a long period of time without experiencing any adverse health effects. The WPL is the concentration a worker can be exposed to for an average 8-hour work day. The STEL defines the concentration of contamination in the air that an unprotected worker may be safely exposed to for up to four 15-minute periods spaced at least an hour apart in an eight-hour workday. VX nerve agent and HD mustard agent are an exception to this, allowing no

more than one 15-minute period in an eight-hour workday.

The STEL level concentration also is useful in monitoring secondary waste generated by destroying chemical weapons. These wastes include items such as personal protective equipment, insulation, cleaning materials and other solid waste materials. Secondary waste is generally considered hazardous and may have been exposed to low levels of agent. CMA adapted the STEL level vapor concentration to screen for agent-exposed waste material.



An Automatic Continuous Air Monitoring System is used to detect the presence of agent and alarm as appropriate.

The STEL is meant to be used to determine if a worker was exposed to agent for the specific 15 minute timeframe. A health professional on the site will perform an exposure evaluation to determine this. To allow for measurements of airborne agent concentrations to be commonly communicated without being confused with a potential exposure, the adapted STEL now is called the Vapor Screening Level (VSL). It is the same vapor

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Vapor Screening Level (VSL) *continued*

concentration as the STEL, but unlike a STEL, a VSL is determined from air sampled less than 15 minutes—typically about five minutes. VSLs are used to supplement the STEL to protect workers' health during plant operations as waste is generated and moved to storage areas within the plant. VSLs also help in planning for waste transport and disposal.

Chemical demilitarization sites and VSLs

For example, after eliminating its mustard agent stockpile, the former Aberdeen Chemical Agent Disposal Facility (ABCDF) located at Aberdeen Proving Ground, Md., used VSLs to categorize secondary and demolition wastes for transportation and disposal off site. Workers at ABCDF used VSL air monitoring and laboratory analysis to separate clean and decontaminated items from items with extremely low levels of agent residue and moderate to high agent-contaminated material.

The distinction between decontaminated and contaminated secondary waste is based on the VSL measurement. This determines how the material will be packaged for transportation and how it will be disposed. It also is used to ensure that the workers are aware and take the appropriate precautions to protect themselves and the public.

The VSL also is used to monitor air in the plant for the presence of agent, as is the case at the Umatilla Chemical Agent Disposal Facility. If the VSL is exceeded, an alarm sounds and workers evacuate. Air in that part of the plant is then measured for a full fifteen minutes to make sure it is within the STEL. Meanwhile, using the VSL allows a more immediate reading, alerting workers to exit sooner, thus maximizing worker protection.

VSLs increase safety

By using the VSL for monitoring and screening, chemical demilitarization sites not only ensure workers' safety by minimizing the risk of agent exposure, but also maximize the public safety by accurately tracking and knowing which waste must be destroyed on site and which drums can be transported safely to a permitted and licensed off site disposal facility.

CMA continues to safely eliminate the nation's stockpile and non-stockpile chemical weapons. VSLs help CMA make a safe process even safer for workers, the public and the environment.



These workers are wearing the appropriate level of personal protective equipment as dictated by the type of waste being handled and STEL monitoring.